Ad Hoc Triennial Review Committee:

Reconvened to Review Six
Water Quality Criteria Issues
DEQ Presentation
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Issues Separated out from Triennial Review for Additional Investigation

5. Ammonia

6. Copper

Ammonia

- Recently published research on early life stages of several species of freshwater mussels indicate that adverse toxic effects are possible at concentrations of ammonia that are lower than what would be allowed by the current criteria for ammonia.

EPA Has Been Investigating the Issues Involving Freshwater Mussels and Ammonia For Some Time

Recent EPA Statements Regarding Review of Ammonia Criteria and Freshwater Mussel Issues

- **Continuing efforts on the ammonia aquatic life criteria re-evaluation uncovered some significant technical issues last year regarding data acceptability for the purposes of deriving aquatic life criteria in general.**

Recent EPA Statements Regarding Review of Ammonia Criteria and Freshwater Mussel Issues

- **A workgroup of EPA scientists involved in the aquatic life criteria guidelines efforts have developed position statements and supporting rational for how the group proposed EPA address the issues in future criteria documents.**

Recent EPA Statements Regarding Review of Ammonia Criteria and Freshwater Mussel Issues

- **The position statements and rational were vetted through external peer review and based on those recommendations, EPA drafted the ammonia criteria re-assessment document incorporating new data for freshwater mussels, snails and fish.**

Recent EPA Statements Regarding Review of Ammonia Criteria and Freshwater Mussel Issues

- **EPA is currently reviewing an internal draft of the ammonia criteria reassessment.**

- **EPA has been working with the Services on the ammonia criteria re-evaluation and will be discussing the draft re-assessment with the Services prior to the planned publication of the draft proposed criteria reassessment in the Federal Register in the Fall of 2009.**

DEQ Suggestion on Ammonia

- **DEQ will closely follow EPA's efforts in reevaluating the ammonia criteria.**
- **When their recommendations are finalized DEQ will be in a position to initiate a change in Virginia's ammonia criteria.**

Copper

- **Recent copper toxicity studies on freshwater mussels have provided additional information**

- **US EPA's most recent recommended criteria for copper involves use of a biotic ligand model (BLM)**
- **Recent acute values for freshwater mussels are similar to those of the most sensitive genera in the dataset for the BLM**

Copper; USGS Review

- **USGS reviewed the recent freshwater mussel data (soon to be published) and found that the relationship between toxicity and organic carbon as used in the BLM also worked for the mussel data**

- **The hardness-toxicity relationship did not work well in predicting the effect hardness has on copper toxicity to mussels**

Copper; USGS Review (concerns)

- **Some individual tests had lower endpoints than BLM criterion**

- **USGS still has some concerns with new data and the possible effect of organic carbon from natural waters on the toxicity of copper**

Copper; USGS Review

- **USGS added the new copper toxicity data for freshwater mussels to the EPA-BLM dataset and changed the FAV from 4.7 ug/L to 4.6 ug/L**

- **This suggests that the BLM copper criteria may be close to providing useful protection to freshwater mussels**

Toxicity of copper to mussels is not yet being as intensively investigated by EPA as is ammonia

- **Some of the issues involving the mussel data and criteria development that have been identified in the reassessment of the ammonia criteria could have an influence on how these data are handled for other criteria development including copper**.

More Copper-Mussel Toxicity Reviews Coming

- **USGS review of copper acute toxicity-organic carbon relationship is to be published soon**
- **Review of chronic studies also planned**

Summary

- **Additional studies are still becoming available on copper–mussel toxicity.**

- **The relationship of these new toxicity data to the new EPA biotic ligand model for copper is still somewhat unclear.**

Summary

- **USGS' recalculated FAV (4.6 ug/l copper)is very close to the EPA's BLM FAV (4.7 ug/l).**

- **How EPA uses mussel toxicity data in reevaluating the ammonia criteria will help in deciding what effect the copper data could have on the copper criteria.**